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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Kazunori KANEDA.

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For : TIRE REINFORCING MEMBER AND REINFORCED
PNEUMATIC TIRE

Art Unit & Examiner : 1733, FISCHER, JUSTIN R

DECLARATION UNDER 37 CFR 1.132

ASSISTANT COMMISSIONER FOR PATENTS

WASHINGTON, D.C. 20231

Sir:

I, Kazunori KANEDA, residing 2971-1, Kitairiso, Sayama-shi,
Saitama-ken, Japan, declare that:

1. I graduated from Tohoku University with a Master's degree in School of Engineering in March 1994, and joined BRIDGESTONE CORPORATION in April 1994. Then, I was engaged in the research and development of a steel cord for five years, and from November 1999, I have been engaged in the development of the steel cord-to-coating rubber adhesion in Material Development up to the present.

2. I am the sole inventor of present U.S. Patent Application as identified above and familiar with the subject matter disclosed in the application.

3. Experiment

Object of Experiment

In order to clarify differences in the tests for the initial adhesion and the resistance to adhesion loss between two 11R22.5 size truck/bus tires, one of which has a squeegee rubber composition containing hydrotalcite, defined in the present invention, and the other of which has a coating rubber composition containing hydrotalcite, disclosed in Fukuhara (JP2000-17115), the following experiments were conducted.

Procedure of the Experiment

The same procedure as in Example 1 to 5 in the specification was repeated to prepare test tires No.1 to 4.

Compounding Formulation

Each rubber composition consists of 100 parts by weight of natural rubber, 55 parts by weight of carbon black FEF, 1.0 part by weight of a plasticizer, 2.0 parts by weight of cobalt naphthenate, 6 parts by weight of zinc oxide, a predetermined amount of hydrotalcite (KW-2200, trade mark of Kyowa Chemical Industry Co., Ltd.), 2 parts by weight of N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine (Nocrac 6C, trade name of Ouchi Shinko Kagaku Kogyo Co., Ltd.) as an antioxidant, 5 parts by weight of sulfur, and 0.8 part by weight of N,N'-dicyclohexyl-2-benzothiazolylsulfenamide (Nocceler DZ, trade name of Ouchi Shinko Kagaku Kogyo Co., Ltd.) as a vulcanization accelerator.

Result

The results obtained are shown in the following Table.

Table

Test Tire No.	1 Example A	2 Example B	3 Comparative Example C	4 Comparative Example D
Amount of hydrotalcite in the coating rubber composition (parts by weight)	—	—	10	20
Amount of hydrotalcite in the squeegee rubber composition (parts by weight)	10	20	—	—
Initial adhesion (%)	95	90	85	75
Resistance to adhesion loss (%)	65	70	50	30

4. Consideration

It is clearly recognized from the results of the above Experiments that hydrotalcite, when used in larger amounts in the coating rubber composition, captured sulfur and a vulcanization promoter in it during the vulcanization, thereby failing to improve both the initial adhesion and the resistance to adhesion loss.

On the contrary, it is also clearly recognized that, when hydrotalcite was used in larger amounts in the squeegee rubber composition, the captures of sulfur and a vulcanization promoter in the coating rubber composition during the vulcanization was effectively prevented, thereby sufficiently improving both the initial adhesion and the resistance to adhesion loss.

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5. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

March 8, 2005

Kazunori KANEDA

Date

Kazunori KANEDA